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RECENT LITERATURE.

BESSEY'S BOTANY.¹—To one who is desirous of obtaining a knowledge of general botany we should unhesitatingly recommend this manual. Most of the botanies which the student deals with are manuals of the flowering plants, rather than of plants in general, and thus he is led to believe that there are few plants in the world besides the flowering ones, that what do exist are of little importance, and thus his idea of the plant world is a limited and one-sided one; and by plant we mean not a phanerogam or cryptogam, but a plant as distinguished from an animal. In the same way many of our manuals of zoölogy are treatises on the vertebrated animals rather than on animals in general. It is true that in order to teach the elements of botany to beginners it is better to give them a general idea of the structure, physiology and mode of development of a common, well-known and accessible flower or tree; but if the study of botany is to be made a discipline, if the student is required to acquire a good general knowledge of the plant world—and our college students should be required to attain such knowledge—he must, after acquiring a good general knowledge of a few common flowers, master the kind and extent of knowledge contained in a book like the one before us. In short, he should study with the aid of some such book as this the types of the leading divisions of plants, beginning with the Protophytes and ending with the algæ, mosses, ferns and flowering plants, or at least, if the pupil is not carried so far in his studies, the teacher should be armed at all points in his knowledge of general botany, so that he may rightly inform the pupil regarding the structure and physiology of the lower plants, for the sake of bringing out more clearly the position in nature and general relations to other organized beings of the flowering plants.

While, therefore, this book is designed apparently for advanced classes, it will be of especial value to the thousands of teachers of botany in the higher schools scattered over the country. Without disparaging school books written by other botanists, it seems to us that Prof. Bessey's book is indispensable to the teacher of botany as it is or should be taught in these days in our leading colleges and universities.

It moreover derives its value in large part from being compiled from the works of Sachs, De Bary, Hofmeister, Strasburger, Nägeli, Schwendener and others; the first part following quite closely Sachs' botany, many of the admirable cuts in that book being reproduced, so that those who cannot obtain the more costly and voluminous work of Sachs can master this book.

The volume is divided into two parts; the first consists of

¹ *Botany for High Schools and Colleges*. By CHARLES E. BESSEY. American Science Series. New York, Henry Holt & Co., 1880. 8vo, pp. 611. \$2.50.

twelve chapters on the following subjects: protoplasm, the plant cell, the cell wall, the formation of new cells, the products of the cell, the tissues, the tissue systems, intercellular spaces and secretion reservoirs, the plant body, the chemical constituents of plants, the chemical processes in the plant, and twelfth and lastly, the relations of plants to external agents. We have read most of this part with much interest, and do not know of a briefer, clearer and better illustrated exposition of the subjects treated. It is well adapted to give one who has but little special knowledge of botany a clear conception of the plant as an organism. A good many technical names are used, and an elementary knowledge of botany is required of the student, so that while we doubt whether high school classes are sufficiently advanced to use the book, the teachers of such classes should master this portion and present it in as simple language as possible to their pupils.

The second part occupies the last four hundred pages of the book, and is entitled, *Special Anatomy and Physiology*. It treats of the general classification of plants. The arrangement of the lower plants is a modification of the system of Sachs, while the author has made a considerable innovation in raising the Proto-phyta, Zygosporæ, Oösporæ and Carposporæ to the dignity of primary divisions of the vegetable kingdoms, of the same rank as the Bryophyta, Pteridophyta and Phanerogamia. This part contains brief general descriptions of the cohorts, orders and tribes of plants, with sufficient reference to economic botany.

The illustrations are excellent and abundant, there being five hundred and seventy-three cuts scattered through the volume, a large number taken from Sachs' Botany, from De Bary, Hofmeister and other German, French and English works, while a number are original, having been drawn by Mr. J. C. Arthur.

The work bears evidence of care and accuracy in its preparation, and while we have borne testimony to the general plan and its treatment, we leave to others the task of detecting and noticing the errors and shortcomings, if such occur.

HUXLEY'S INTRODUCTORY TO SCIENCE PRIMERS.¹—Every incipient biologist or geologist should study this little primer, which will serve admirably its purpose as a brief and plain introduction to the study of nature. It is well calculated to be used as a text book for classes in elementary biology or geology, and we intend to use it as a basis for preliminary instruction to a course of physical geography. Beginning with nature and science it treats of sensation and things, causes and effects, the order of nature, laws of nature, and gives a definition of science. A second part discusses material objects, which are divided (A) into mineral bodies,

¹ *Science Primers*. Edited by Profs. HUXLEY, ROSCOE and BALFOUR STEWART. Introductory. By Prof. HUXLEY, F.R.S. New York, D. Appleton & Co., 1880. 18mo, pp. 94. 35 cents.